# PROTEIN-PROTEIN INTERACTIONS IN LIPID MEMBRANES: A SINGLE PARTICLE STUDY OF BCL-2 FAMILY PROTEINS

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Proteins from the Bcl-2 family plays a central role in apoptosis. Pro-apoptotic members of the family promote outer mitochondrial membrane permeabilization and cell death, while the anti-apoptotic members promote cell survival by counter-acting the action of pro-apoptotic members. By presiding over what is essentially the “point-of-no-return” step in the apoptotic pathway, Bcl-2 family proteins literally control cellular fate. When studying the complex network of interactions between Bcl-2 family proteins, it is essential to recognize the role played by the mitochondrial membrane in mediating protein-protein interactions. However, it is quite difficult to quantify the strength of these interactions in a lipid membrane, as the soluble fraction of the proteins interferes with most measurements. To circumvent this issue, we use single particle tracking to directly observe molecular interactions between fluorescently labelled proteins. Our measurements of association constants can then used to discriminate between the different models proposed for the interaction pathway of Bcl-2 family proteins.